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13 August 1985

West Europe Report

SCIENCE AND TECHNOLOGY



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13 August 1985

WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

CONTENTS

AEROSPACE

Launchers, Satellites, Multinational Plans in 1985 CNES Budget (AFP SCIENCES, 28 Mar 85).....	1
Arianespace: Finances, Orders, Marketing Efforts (AFP SCIENCES, 6 Jun 85).....	11
France Woos Japanese Market for Launchers, Satellites (AFP SCIENCES, 6 Jun 85).....	13
Briefs SEP Shares Marketed	14

BIOTECHNOLOGY

Dutch Firm, University Plan Biotech Project To Compete With U.S. (Wubbo Tempel; NRC HANDELSBLAD, 29 Jun 85).....	15
New Genetic Engineering Lab To Be Set Up in Norway (Einar Kr. Holtet; AFTENPOSTEN, 18 Jun 85).....	17
Genes Cloned in Norway, Veterinary Applications (Einar Kr. Holtet; AFTENPOSTEN, 19 Jun 85).....	18

CIVIL AVIATION

MBB Studies Variable-Camber Wing for Airbus (MBB AKTUELL, Feb 85).....	20
French Program CHARME Develops Propfan Aircraft (AFP SCIENCES, 14 Mar 85).....	22
FRG Uses Laser for Non-Destructive Testing in Wind Canal (VDI NACHRICHTEN, 5 Apr 85).....	25

COMPUTERS

Olivetti of Italy To Increase Share in U.S. Firm (COMPUTERWOCHE, 26 Apr 85).....	27
FRG To Use New Cyber 205 Supercomputer for Meteorology (H. Weiss; VDI NACHRICHTEN, 5 Apr 85).....	29

FACTORY AUTOMATION

FRG Firm Has New Concept in Flexible Automation in Production (F. Gremm; VDI NACHRICHTEN, 19 Apr 85).....	32
BMFT of FRG To Fund Laser Technology Research (VDI NACHRICHTEN, 19 Apr 85).....	34

METALLURGICAL INDUSTRIES

French Company Explores New Alloys, Powder Metallurgy (Pierre Kerlouegan; LE FIGARO, 3 Jun 85).....	35
--	----

MICROELECTRONICS

Thomson Strategy Includes Increasing Gate-Array Market Share (ELEKTRONIK INDUSTRIE, No 4, 1985).....	37
---	----

SCIENTIFIC AND INDUSTRIAL POLICY

FRG Mid-Level Firms Hurt by Riesenhuber's Budgeting Policies (INDUSTRIEMAGAZIN, 15 Mar 85).....	39
FRG Businesses Anxious About New Tax Regulations (INDUSTRIEMAGAZIN, 15 Mar 85).....	43
New British Policy Aims at Commercialization of Research (AFP SCIENCES, 23 May 85).....	46
Report Lays Out High-Tech Growth for Rheinland-Pfalz (FRANKFURTER ALLGEMEINE, 11 Jun 85).....	48
Europeans Move Toward Concerted Effort on Eureka Project (L'HUMANITE, 25 Jun 85; LE MONDE, 27 Jun 85).....	51
Matra, Norsk Data Agreement, by Julien Pierre	51
Electronics Giants Favorable, by Eric le Boucher	52
Netherlands Paper Perceives Pitfalls for Eureka Scheme (Editorial; DE VOLKSKRANT, 19 Jul 85).....	55
Briefs	
Swiss R&D Financing	57
EC Aid for FRG ESPRIT Programs	57
No Funds for SDI, Eureka	58

TECHNOLOGY TRANSFER

Scientists at Dutch Universities Linked by Computers (PT AKTUEEL, 27 Mar 85).....	59
France Seeks Closer S&T Cooperation With Japan (AFP SCIENCES, 6 Jun 85).....	61
Briefs Austria-Japan Joint Venture	63

AEROSPACE

LAUNCHERS, SATELLITES, MULTINATIONAL PLANS IN 1985 CNES BUDGET

Paris AFP SCIENCES in French 28 Mar 85 pp 24-32

[Unsigned article]

[Text] Paris--"The 1985 CNES (National Center for Space Studies) budget indicates a slight leveling in growth. The operating subsidy remains stable," states the CNES published document which provides a breakdown of appropriations and describes the organization's programs for 1985. The figures are:

Distribution of the 1985 budget, TTC (including taxes), by financing source (in MF)

Entitlements	Initial 1984 TTC budget	1985 TTC
State subsidies	4108.830	4135.466
Program authorizations		
MIR in 1984 chapter 66.80	3084.350	--
PTT in 1985 chapter 69.59	--	3421.000
D.O.		
MIR in 1984 - MRT in 1985		
chapter 36.80	542.980	571.466
Subsidies of "user" ministries	481.500	143.000*
Internal resources	782.555	794.080
Total	4891.385	4929.546

* This amount is divided as follows:

Ministry of Defense	56.000
Ministry of PTT (excluding chapter 69.59)	87.000
Total	143.000

MIR = Ministry of Industry and Research

The total state subsidy is therefore 4135.466 MF TTC, or 3947.000 MF HT (excluding taxes). It is distributed as follows:

Program authorizations	3564.000 TTC	3465.157 HT
Operating subsidies	571.466 TTC	481.843 HT
Total	4135.466 TTC	3947.000 HT

The difference between the various TTC and HT figures represents the amount of the TVA (value-added tax) that CNES must disburse against operating subsidies. This TVA is posted outside the budget.

As a result, all the figures concerning the 1985 budget must be understood to exclude taxes.

Commitment appropriations, excluding taxes, necessary to cover the operations, included in the 1985 CNES budget amount to 4741.080 MF (million francs) against 4763.305 MF for the initial 1984 budget. The investment subsidy is included in the supplemental PTT budget. The "significant increase" in this subsidy compensates for the subsidy reductions expected from "user" ministries.

Programs

I. Multilateral European Cooperation

The appropriations under this title cover the French contribution to the various European Space Agency (ESA) programs. Out of the 1748.75 MF allocated for 1985, 871.1 MF are reserved for the Ariane program, of which 179.5 MF for the production program, 46.35 MF for the industrialization program, 555.25 MF for Ariane 2/3, 475.9 MF for Ariane 4, and 113.85 MF for the preliminary development phase of the HM 60 engine.

The endowments planned for these projects represent 49.8 percent of France's total contribution to ESA.

1. Scientific Programs

Three satellites are being used as part of this program, namely IUE (geosynchronous orbit observatory for UV studies of the sky), ISEE (magnetosphere), and EXOSAT (X-ray sources).

Five programs are being worked on: the space telescope (Hubble space telescope) to be launched in mid-1986, Ulysse (solar polar mission) planned for 1986, HIPPARCOS (the sky of 100,000 stars) whose launching is expected in 1988, GIOTTO (Halley comet), and ISO (IR astronomy) to be launched by Ariane in 1982.

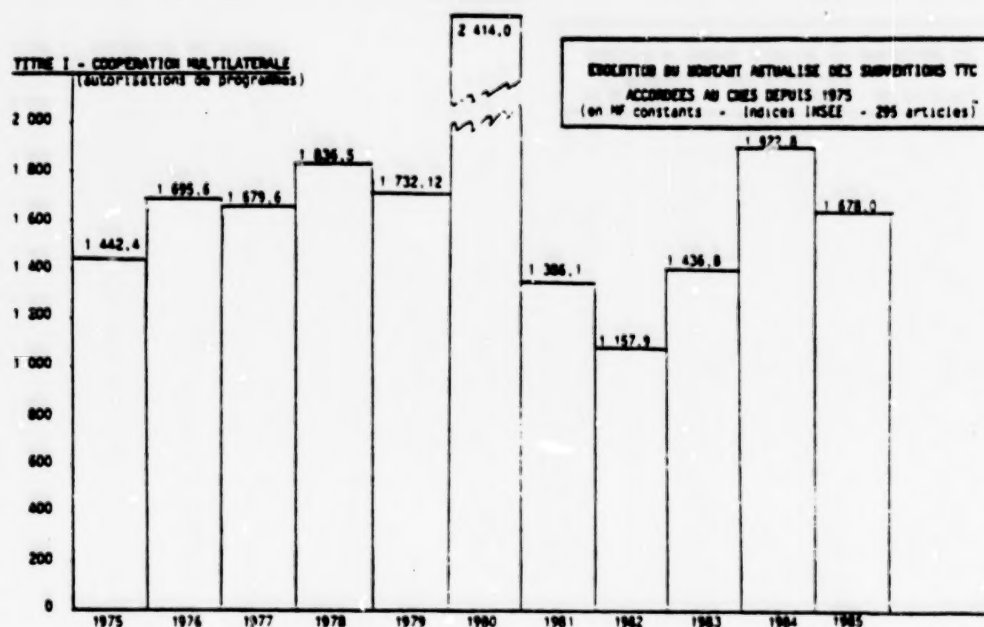
Some of the future projects are SOHO and CLUSTER (solar physics and plasma physics), as well as the AGORA probe to Saturn's system and asteroids (CASSINI).

2. Telecommunication Satellites

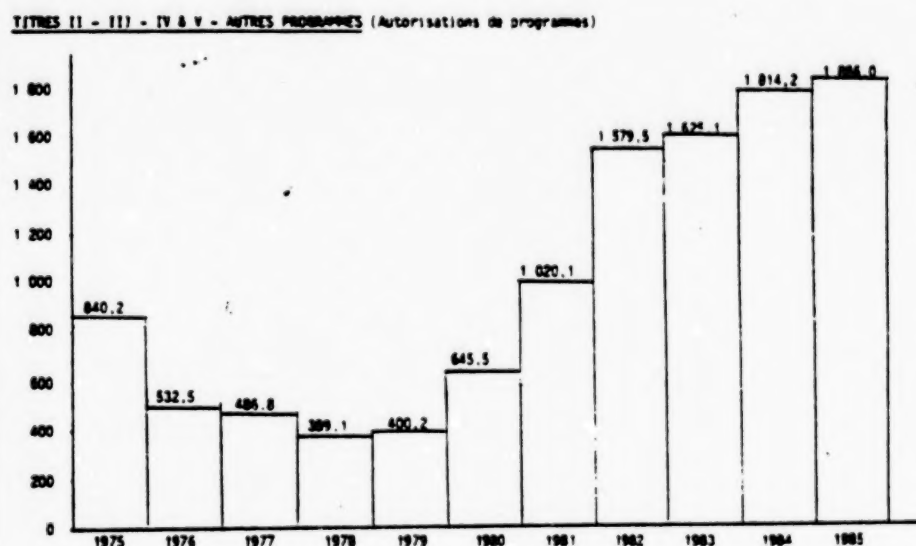
Covers the two ECS programs (whose third portion should be launched in 1985), and MARECS.

Actual Amount of CNES TTC Subsidies Since 1975 in constant MF -- INSEE
(National Institute for Statistics and Economic Studies) indicators --
295 items

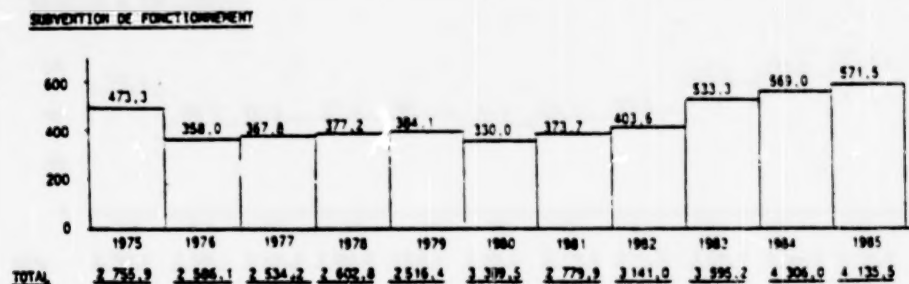
Title I. Multilateral Cooperation (Program Authorizations)



Titles II, III, IV, and V. Other Programs (Program Authorizations)



Operations Subsidies (TTC)



3. Earth Observations

Two programs: METEOSAT, which should be launching METEOSAT P2 in 1986 with Ariane IV; and ERS 1, whose first launching is planned for April 1989.

4. Space Vehicles

The first orbiting of EURECA by the American Space Shuttle is planned for March 1988. Also mentioned are COLUMBUS and the construction of equipment for research in microgravity.

5. Launching Facilities

Development of the Ariane program and development of the MH 60 engine. For the latter, the goal remains a ground qualification of the engine in 1991, a first flight test in 1993, and an operational flight in mid-1985 [as published].

Placement in operation of ELA 2 at Kourou, which should occur in August 1985.

II. Bilateral Cooperation

The 1985 appropriations under this title are 556.850 MF.

1. Cooperation With NASA

Includes a large number of areas and results in multiple projects:

ULYSSE and the space telescope;

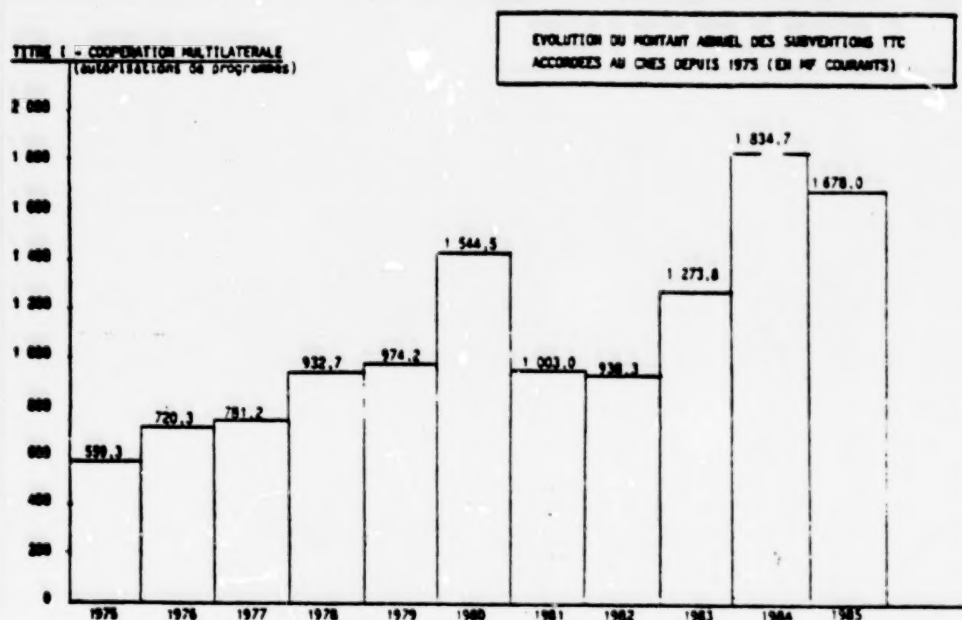
GALILEO (Jupiter exploration program carrying the NIMS and JOCONDE experiments);

JUPITER 3 (astronomy with an American balloon), first flight planned for 1986;

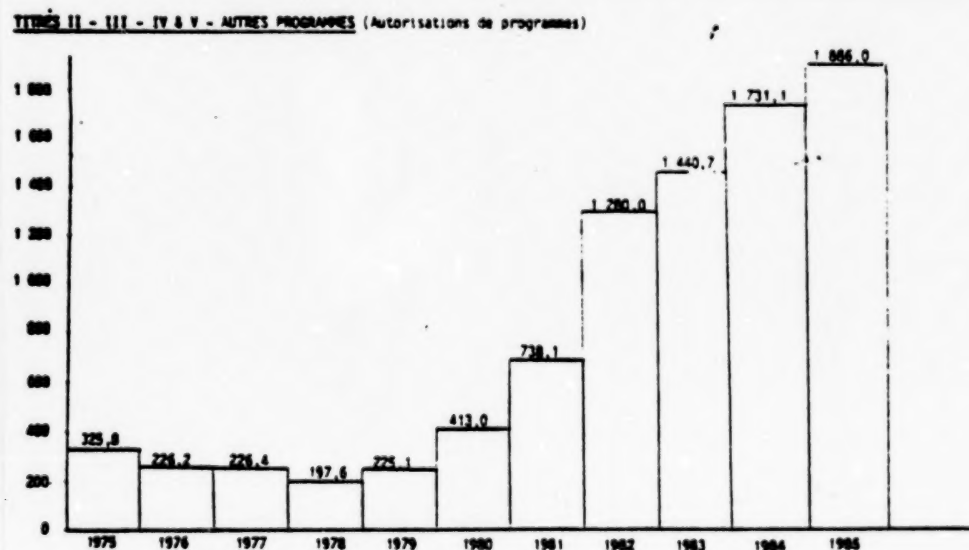
ATRC, a high resolution, sun imaging experiment, installed on American rocket probes launched in 1984 and 1985;

Annual CNES TTC Subsidies Since 1975 (in current MF)

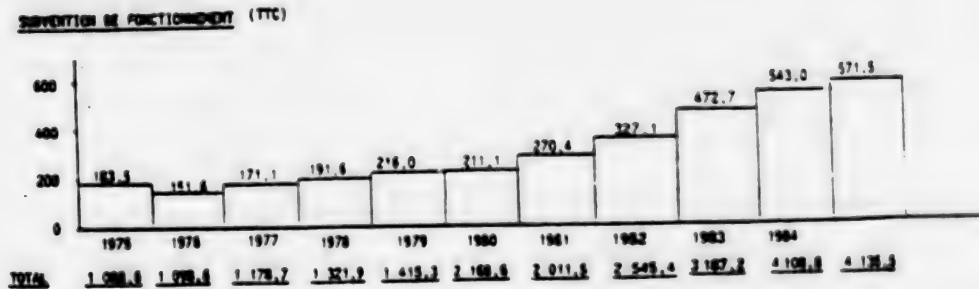
Title I. Multilateral Cooperation (Program Authorizations)



Titles II, III, IV, and V. Other Programs (Program Authorizations)



Operations Subsidies (TTC)



WINTER UARS, an experiment to study the upper atmosphere (winds, temperature, chemical composition), planned for 1989.

Also included is the LIDAR U2 PLANE (ozone study).

Earth Sciences includes the large POSEIDON program (general ocean traffic), with satellite launching beginning in 1989, MEDOC II (study of pole motion), and the ECUME DES NUITS, ERBE SAGE, and CGS projects.

The essential program in earth observation is ARGOS, and the installation of a data processing center is planned in the United States in 1985.

Also included is SARGOS, which beginning in 1985 will undergo preoperational tests.

Lastly, the major manned flights experiments cover:

Preparation of the BAUDRY flight;

MEPHISTO (equipment for the study of phenomena concerning solidification on earth and in orbit);

AS DE COEUR and ESOPE (behavior of the cardiovascular system and physiological experiments on primates).

2. Cooperation With USSR

This cooperation consists of many projects and experiments:

Gamma-ray telescope project, with launching planned for 1986, and with the installation of SPECTRE II (X-ray and gamma-ray sources and bursts) on the same satellite;

PROGNOZ 85, a program designed to study hydrogen and the interplanetary environment, which includes two SIGNE IV (submillimeter astronomy) experiments, and INTERBALL (relationship between solar wind, the magnetosphere, and the ionosphere);

Breakdown of allocated appropriations (state subsidies and internal resources, excluding tax, in MF)

By category of program	1985 amount	1985	1984
European program	1748.750	36.89	39.91
Bilateral programs	556.850	11.75	11.35
National program	1007.500	21.25	20.66
Technical operational support	659.230	13.90	13.46
General operations	768.750	16.21	14.02
Total	4741.080	100	100

By type of facility

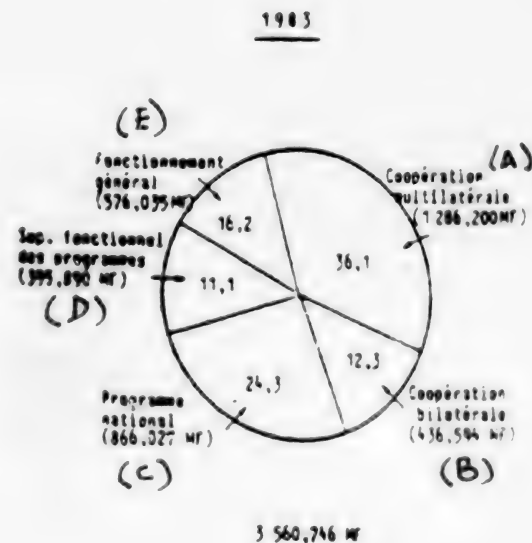
Launchers	1000.650	21.11	17.80
Satellites	1315.300	27.74	34.74
Space vehicles	147.600	3.11	1.90
Balloons	19.900	0.42	0.38
Scientific experiments	163.300	3.44	2.78
Tests and application systems	71.500	1.51	1.39
Research and development	163.000	3.44	2.78
Operational program support	1859.830	39.23	38.23
Total	4741.080	100	100

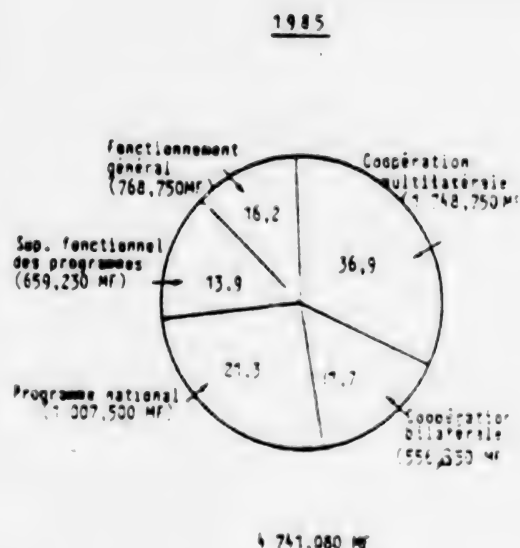
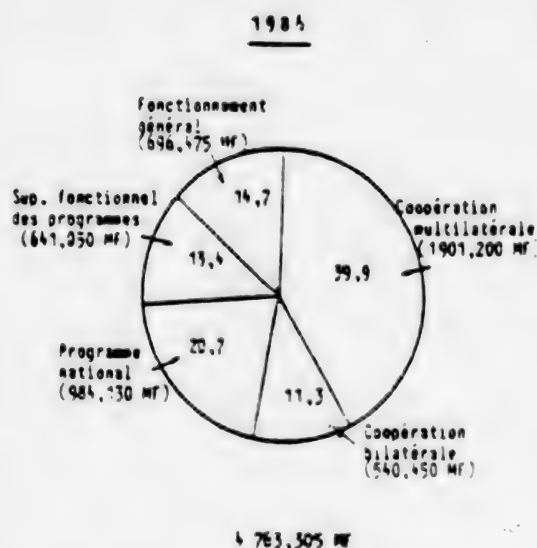
By category of objective

Sciences	517.850	10.29	8.92
Applications, where	2200.400	46.41	50.07
Telecommunications	485.600	10.24	12.86
Earth observations and data collection	714.150	15.06	19.41
Launching means	1000.650	21.11	17.80
Research and development	163.000	3.44	2.78
Operational program support	1859.830	39.23	38.23
Total	4741.080	100	100

The CNES budget (subsidies and internal resources) is divided into five large groups:

- (A) Multilateral cooperation
- (B) Bilateral cooperation
- (C) National program
- (D) Technical operational program support
- (E) General operations





PHOBOS, a study of Mars and its satellite, using probes launched in 1988;

The VEGA project;

The SIGMA project (mapping of galactic and extra-galactic gamma-ray sources, using a telescope aboard a Soviet satellite in December 1987);

Manned flights: experiments are being carried out aboard Soviet craft in the materials science and life sciences.

3. Cooperation With ESA

Numerous experiments on GIOTTO, (HOPE, COPERNIC, MESSAGE, DIDSY, as well as participations in the HIPPARCOS, SATMOS (space meteorology and climate data base), and other projects.

4. Cooperation With FRG

Direct TV, with launchings to occur 1986.

5. Cooperation With Other Countries

Notably Sweden (VIKING and ERIC VLBI).

6. Other Programs

Among future missions, CNET mentions such projects as AELITA and VESTA with the USSR, VEGETATION and OCI with the United States, and GRADIO and MAGNIOLIA in the national sphere.

III. National Program

The national program budget is 23.4 percent higher than in 1984, due primarily to a launcher peripheral program and to a special research and development effort.

This program includes:

1. Scientific experiments: balloons (astronomy, solar physics, and meteorology); space geodesy (GEOS, STARLETTE, and LAGEOS projects); participation in the international program MERIT for measuring the earth's rotation, and so on; and a large number of experiments conducted on the ground or aboard airplanes (planetology, biology, astronomy, and so on).
2. Telecommunications: TELECOM 1A and 1B, platforms, and the ATHOS program.
3. Earth observations, with SPOT as the essential program.

The document also mentions activities with balloons, Ariane V (a system review is planned for 1986), and so on. In general, the objective of CNES' multiannual R/D program is to "allow CNES as well as the national industry to acquire the technical and technologic capabilities necessary for the strength and future development of space applications." It is one of the "major criteria retained for 1985."

It is in this light that studies and tasks are undertaken this year for the systems and specific technologies of the HERMES space airplane program.

The financing of the major areas is distributed as follows:

24 percent for telecommunication and data location and collection
22 percent for earth observation
13 percent for launching facilities
18 percent for orbital infrastructure
23 percent for various actions in science, components, space mathematics, and aerospace technologies.

The appropriations for the national program amount to 1007.5 MF, distributed as follows:

Science	7.350 MF
Telecommunication	71.500
Earth observations	619.700
Space vehicles (balloons)	19.900
Launchers	120.750
Research and development	163.000
Quality and program management technology	5.000
Total	1007.500

IV. Operational Program Support and General Operations

The appropriations for this item went from 1337.250 MF to 1427.980 MF. The general operations of CNES services (personnel costs, operation costs, outside relations, travel) represent 768.750 MF; the remaining endowment of 659.230 MF is allocated as follows:

Domestic and foreign laboratories	16.195 MF
Technical launching and operation facilities	512.585
Station network	22.050
Calculation and data processing	68.000
Test facilities	41.250
Guyana Space Center	356.700
Aire-sur-l'Adour Balloon Launch Center	3.150
Subsidiaries (1)	11.200
TELECOM 1 placement and maintenance (2)	4.735
Control center for exported satellites (3)	5.500
Infrastructure and equipment projects	130.450
Mainland work and equipment	46.000
Guyana work and equipment	84.450
Total	659.230

- (1) ARIANESPACE, SIMKO, INTESPACE
- (2) Receipts from PTT
- (3) Jointly with MATRA, SNIAS, CNES

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AEROSPACE

ARIANESPACE: FINANCES, ORDERS, MARKETING EFFORTS

Paris AFP SCIENCES in French 6 Jun 85 p 27

[Text] Le Bourget--At the end of its first complete year of space activities operations, Arianespace announced, on 6 June at Bourget, a capital increase from 150 to 270 MF [million francs] and a bank loan of 200 MF.

The company, which markets Ariane, currently has bookings totaling 23 firm orders for satellite launchings (6.4 billion francs). Mr Frederic D'Allest, president of Arianespace, also announced a 1984 revenue of 725 MF. Mr D'Allest stated that the company's gross reinvestment margin for the same period had been 30 MF.

After orbiting 12 satellites without any problems, the company has obtained a loan of 200 MF from a pool of banks and the Credit National, to finance its medium- and long-term investments.

"The Ariane launcher is today the most accurate, the most economical, the simplest and most flexible launcher to use, on the commercial launchers market," said Mr D'Allest. To meet its order bookings, the company has had to order 19 launchers from its suppliers: The planned launch rate is presently 6 to 8 launchings per year, amounting to some 10 satellites, depending upon whether Ariane is carrying one or two satellites under its nose cone.

Mr D'Allest also dwelt on the putting in service of a new launching pad at Kourou in October and of the Ariane 4 launcher, which will be able to lift 4 tons into orbit, in 1986. Ariane 5's turn will come in 1994--a launcher decided on last January that will be capable of boosting a 15-ton payload into low-Earth orbit.

Arianespace is now negotiating intensively worldwide to capture markets for satellite launchings, especially in China, where two options for the launching of two television satellites have been obtained by the authorities, and in Japan, where four telecommunications satellites are to be launched around 1990, prior, that is, to the putting in service of the Nippon H2 launcher.

One of the concerns on the part of Arianespace's top management is the evolution of space insurance costs, which as of today appear excessive. Premiums are running as high as 20 percent and launches can no longer be covered in full, owing to losses of satellites by the American Shuttle. On this point, said Mr D'Allest, Arianespace is trying to work out, together with the insurers, new forms of contracts, covering, for instance, 10 or 12 launches, and no longer just one.

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CSO: 3698/556

AEROSPACE

FRANCE WOOS JAPANESE MARKET FOR LAUNCHERS, SATELLITES

Paris AFP SCIENCES in French 6 Jun 85 p 28

[Text] Paris--The Arianespace company has now begun some interesting talks in Japan, and from the company's general manager, Mr Michel Bigot, who has just returned from there, one gets the impression regarding his talks with the heads of the telecommunications companies and ministries concerned that it is not entirely a fun-and-games situation for the American manufacturers of satellites and launching facilities.

Knowing that they need launchers of large telecommunications and direct-TV satellites pending the development of their own large rockets--the told AFP SCIENCES--the Japanese are giving thought to our proposals. It is too early yet to predict the outcome, but since our arrival in that country several months ago on the trip made there by Mr Frederic D'Allest, CEO [chief executive officer] of the company, things have been going better. Europe is no longer absent from a potential market.

Mr Bigot acknowledges that to date Arianespace has signed only three contracts since the start of the year, increasing its revenue slightly, and that more need to be signed. He expects three or four more to be between now and the end of the year, which will bring results closer to the company's target of 10 contracts per year.

In his view, as regards this plan, "1985 has been a sort of 'sabbatical year' with everyone--the builders, the owners of satellites, ...--in a waiting posture. Everything is beginning to stir again in the United States. NASA has not signed any more contracts than we; in fact, less..."

According to Mr Bigot, international competition is going to become more intense as the years go by. The announcement of China's future entry into the launchers market, with its "Long March I, II and III" rockets, has somewhat surprised that market. As for the Soviets, they will be unable to penetrate it unless they offer launchers and satellites together.

9238
CSO: 3698/556

AEROSPACE

BRIEFS

SEP SHARES MARKETED--Paris--The SEP [European Propulsion Company], which develops, in particular, the engines for the Ariane rocket, and the solid-fuel propulsion systems for the French nuclear strike force, is going public [in part] as of 29 May, with shares to be offered on the second market of the Paris Stock Exchange. Speaking to financial analysts on 22 May, Mr Roger Lesgards, CEO [chief executive officer] of SEP, a subsidiary of the nationalized company SNECMA [National Aircraft Engine Study and Manufacturing Company], pointed out that the marketing of SEP shares is expected to enable, among other things, the accompanying of the Ariane program's industrialization phase [as published]. A total of 60,000 shares, that is, 12 percent of SEP's capital stock, will be put on the market. The shares, with interest running from 1 January 1985, will be offered at a minimum price of 330 FF [French francs]. This price can be weighed against its financial context as of 31 December 1984: Consolidated tangible net assets of 342 FF per share, a gross reinvestment margin of 95.87 FF per share, a net profit of 24.52 FF per share for the parent company and of 27.81 FF per share taking into account its subsidiaries. Overall yield is 7.3 percent based on the dividend paid out during the 1984 fiscal year (16 FF net). Mr Jean Sollier, deputy general manager of SNECMA, for his part, stated that the marketing of SEP shares responds to a policy of the Company designed to combine savings with development of the group. [Text] [Paris AFP SCIENCES in French 23 May 85 p 30] 9238

CSO: 3698/556

BIOTECHNOLOGY

DUTCH FIRM, UNIVERSITY PLAN BIOTECH PROJECT TO COMPETE WITH U.S.

Rotterdam NRC HANDELSBLAD in Dutch 20 Jun 85 p 14

[Article by Wubbo Tempel: "University and Akzo Have Plans for Biotech Enterprise"]

[Text] Oss, 20 June -- Akzo Pharma is discussing a plan for a "Dutch initiative" involving the commercial production of certain biotechnological substances, with the Catholic University of Nijmegen, a few other research institutions and MIP [Industrial Projects Company].

It involves monoclonal antibodies for therapeutic purposes. Mr W. Smit, member of the board of directors of Akzo Pharma, said that a separate enterprise is a serious option in the plan. Akzo Pharma is the pharmaceutical arm, located in Oss, of the Akzo corporation, with, among others, Organon as a production company. Smit stressed that it involves a Dutch initiative: knowledge from Dutch universities and institutions being used for Dutch enterprises.

This remark must be seen in terms of the fact that several American biotechnological companies are being established in the Netherlands. Next week, for example, the American CENTOCOR will start construction of a branch in Leiden. CENTOCOR came to the Netherlands with the assistance of MIP. The latter will participate at the level of 10 percent in the Dutch branch.

Smit calls it "wrong" that the knowledge of Dutch universities and institutions is being used by the Americans, "except, of course, in those cases when Dutch industry itself is not interested." Smit: "If we don't do anything, then there will be a brain drain. We must use Dutch knowledge in order to bring it together and propose something ourselves." Smit's counterpart in Nijmegen was Dr P.J.A. Capel, head of an immunology research lab at Radboud Hospital. According to Capel, a sufficiently large Dutch partnership would also generate interest at other universities.

Protective Substances

Within the partnership, the partners want to arrive at the production of monoclonal antibodies for therapeutic purposes. Monoclonal antibodies are protective substances from human or animal bodies which can be produced in large quantities with new biotechnological techniques. Up to now the substances have been used primarily in diagnosing illnesses. However, they can also be used

for therapeutic purposes. In that case the substances are introduced into the body to prevent undesirable symptoms.

Capel mentioned immunosuppression as the most significant practical short term use. That is a short suppression of the human defense system. This can be useful, for example, in kidney or bone marrow transplants. In those cases, the patient's defense system does occasionally reject the newly received tissue.

Akzo Pharma brings the knowledge to produce antibodies on a large scale into the partnership. The company already manufactures several kinds. The university will provide the specific knowledge about antibodies. The intention is to manufacture also small non-commercial amounts of antibodies for further research.

Smit expects an official decision within about 3 months. Production would take place at Akzo Pharma's new facility for the manufacturing of antibodies in Oss, which is currently in the construction stage. Akzo Pharma wants to have this center ready in a year.

The director of MIP, engineer W. de Boer, commented that the arrival of the American companies has a stimulating effect on biotechnology in the Netherlands. He considers the plan of Akzo Pharma and the university an illustration of this.

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CSO: 3698/526

BIOTECHNOLOGY

NEW GENETIC ENGINEERING LAB TO BE SET UP IN NORWAY

Oslo AFTENPOSTEN in Norwegian 18 Jun 85 p. 14

[Article by Einar Kr. Holtet: "New Genetic Engineering Laboratory"]

[Text] A research laboratory for genetic engineering and cell culture will be established at the Norwegian National College of Agricultural Engineering. This information was provided by forest owner Annie Blakstad, chairman of the Norwegian Research Council for Agricultural Science (NLVF), at an NLVF lecture session yesterday in Oslo. The research council has already begun to concern itself with the sensational new methods of biotechnology. The laboratory at the college in As will conduct independent research in its fields in addition to being a service agency and a workplace for other institutes which are involved in such research.

Biotechnological research linked to veterinary medicine is expected to be established on a somewhat more decentralized model at the Norwegian Veterinary College and the Veterinary Institute. There will also be cooperation between the universities in Tromsø and Oslo with respect to agricultural research and biotechnological research on plants.

This very thing is clearly an important field for interdisciplinary research and teamwork. An agreement has already been reached on the division of labor in plant research based on biotechnological methods, where the three mentioned environments are parties to the agreement.

Through the Research Council's Committee on Cooperation, the NLVF will try to bring about the best possible coordination of Norwegian research within biotechnology. But people continue to wait for extraordinary government funds in order to build up competency and invest in buildings and installations.

"The new biotechnological methods can provide us all with new benefits," pointed out Annie Blakstad, who also stressed that developments in science pose great demands on how research is directed and controlled in society. There are reports from many countries that biotechnology will play a significant role in many areas, especially agriculture and agricultural research. Annie Blakstad was pleased with the authorities' promise of real growth in research the next 4 years. As is known, the government has made biotechnology a major sphere of effort--and mariculture, also in connection with biotechnological methods, will be a central field of research in the future.

BIOTECHNOLOGY

GENES CLONED IN NORWAY, VETERINARY APPLICATIONS

Oslo AFTENPOSTEN in Norwegian 19 Jun 85 p 49

[Article by Einar Kr. Holtet: "Norwegian Researchers Accept Challenge: Norwegian Gene Splicing Gives Effective Medicine"]

[Text] The genetic engineering revolution has begun in Norway. Through the "art" of genetic "engineering," bits of genes are spliced together--and research is making headway in Norway. Recently in this country, genes were cloned which led to the effective production of promising hormones against milk fever. This disease and others in domestic animals cost farmers and society enormous sums every year.

Professor Jens Gabriel Hauge was able to report during Agriculture Week in Skedsmo that growth hormones from swine and cattle are being tested abroad right now. When such substances are injected into milch cows, it has resulted in the production of 40 percent more milk by the cows!

If the same growth hormones obtained by genetic engineering are used in heifers, it is reported that the heifer's udder grows faster than otherwise.

The new technology, which goes under the name of recombinant DNA engineering, makes it possible to manufacture purer vaccines in addition to the various hormones which are prepared artificially. The vaccines are also generally less dangerous to use than those we are otherwise accustomed to, thinks Professor Hauge, who is associated with the Biochemistry Institute at the Norwegian Veterinary College.

"Work is being done right now on the production of 13 different virus vaccines, including vaccines against foot-and-mouth disease and rabies virus (a virus which leads to what we in Norway call hydrophobia). The first vaccine based on DNA engineering or so-called gene splicing for domestic animal use was a vaccine for diarrhea in calves and piglets. It was made by cloning a gene in a type of intestinal bacterium. Today, vaccines are also manufactured in the same way against parasites, something we have not had vaccines for earlier."

The genetic material which directs hormone production after the cloning is of very different composition. A hormone called paratyroidea is thought to have

a preventive effect against milk fever. The gene which controls production of this hormone was cloned in Norway a very short time ago. It has reportedly been known for a while abroad.

Against Cancer

Among the first pharmaceutical products of the new technology were hormones like insulin, growth hormone and interferon, which researchers--especially in the United States--believe can be effective against some forms of cancer.

Thus pharmaceutical research in human medicine goes hand in hand simultaneously with exploitation in veterinary medicine in a long list of countries. Progress is being made tremendously fast, says Professor Jens Gabriel Hauge, who, naturally enough, is mostly concerned with the veterinary aspect.

Defects

"We are familiar with a lot of defects in domestic animals. It is important for breeding purposes to discover the carriers of the sickness genes which exist. This is possible today with the help of a DNA fragment (a part of the genetic material spiral or the 'double helix,' as it is called abroad). With such a DNA fragment (a 'probe') for the gene which is the sinner in each individual case, the genetic material from the cow or the sheep can be studied in a blood specimen from the animal. The hereditary tendency will then be clarified. Obtaining such a probe requires a lot of work. We are in the process of doing it in connection with the well-known, troublesome and unremunerative stress syndrome in the pig."

Such probes are made today in human medicine by means of the radioactive isolation of gene fragments from dangerous microorganisms. The substances are produced commercially for a virus like the herpes simplex virus or the jaundice virus, the hepatitis B virus.

12327

CS0: 3698/577

CIVIL AVIATION

MBB STUDIES VARIABLE-CAMBER WING FOR AIRBUS

Munich-Ottobrunn MBB AKTUELL in German Feb 85 p 3

[Article: "Getting Into the Spirit of Big-Bird Gliding Flight: When the Airbus 'Cambers' Its Wings"]

[Text] Bremen (wa). Steady improvement in lift and drag values in aircraft construction are the primary tasks confronting aerodynamic research and development. For more than half a century airplanes throughout the world have been successfully built on the basis of theories of the "old school." It was mastery of supersonic flow over the wing surface (at cruising speed) which gave air transport a decisive economic leap forward. The latest technology, designated "variable camber," together with any subsequently acquired knowledge, will be applied to the future long-distance aircraft Airbus TAll and later to the TA9--an airbus version having high seating capacity for short- to medium-distance routes.

Transonic profiling with greater wing thickness yields more space for fuel, while at the same time through weight reduction and improved aerodynamics a lower fuel consumption is achieved. This philosophy was for the first time successfully applied in the aerodynamic design of the Airbus A310.

But since every aircraft--even with the wing design which has up to now been aerodynamically the most successful--flies under its critical design conditions very seldom or only by chance (for example, at an altitude of 33,000 feet, velocity 0.78 Mach = about 830 km/hr), in the future wings will be so designed that their performance data will be almost optimal at all altitudes.

In other words, just as in slow flight the airplane's lift and drag are adapted to take-off and landing conditions by extending flaps so in the future, also in cruising, flight aerodynamic efficiency will be further improved at every flight altitude and in all velocity ranges by means of a suitable optimal wing camber.

In the past aerodynamicists have always attempted to imitate bird flight physically and mathematically. With the variable camber of an aircraft wing one is coming very close to the mobile profile of a bird's wing. It would be very expensive, if not impossible, to imitate structurally the flexible surface of a bird's wing using today's materials. But even now it is possible to achieve

the decisive effects of a bird wing in gliding flight simply by giving mobility to a wing, for example, that of an A310, with the aid of its trailing edge flaps.

The flaps which up to now have been required only as auxiliary high lift devices in takeoff and landing are now used in cruising flight to achieve the best possible wing efficiency at any altitude and at any velocity. High wing efficiency is attained when the ratio of lift to drag is as high as possible. Gliders, for example, have a very favorable ratio of lift to drag which directly determines the glide angle.

In the aerodynamic development departments of the MBB cargo and transport aircraft division the first wind tunnel measurements for a variable-camber wing are already available. They confirm results obtained on the basis of a wing modification which had been introduced into an Airbus A300-600 and which in comparison with the A300 wing yielded an improvement of more than 2 percent in aerodynamic efficiency simply by means of a fixed-installation camber change in the inner wing.

In the next 2 years aerodynamicists with the planned support of the Federal Ministry of Research and Technology (BMFT) in a "controlled flow wing" research program will establish the technological basis for a variable-camber wing design.

Essentially the program encompasses the application of variable camber to a transonic wing in a long-distance aircraft (such as, for example, the TALL). The task here will be to configure previously employed flaps for variable-camber use over the entire wing span. In a further developmental phase it is intended to install in an aircraft half-model having a semiwing span 4.5 meters a computer-controlled servosystem and control system producing variable camber. Flight is simulated in a wind tunnel. The aim will be to establish that variable-camber technology is of high utility.

This technology is being promoted to conserve additional fuel (fuel costs make up as much as 40 percent of the total cost figure for an air transport company). In the past it was necessary for the wing geometry to be designed in expectation of a certain flight regime over short, medium or long routes. With the aid of the new technology it is possible for this same basic wing structure to cover a much greater range of flight conditions economically. This also means a considerable reduction in development costs within the program for a particular aircraft family.

8008

CSO: 3698/497

CIVIL AVIATION

FRENCH PROGRAM CHARME DEVELOPS PROPFAN AIRCRAFT

Paris AFP SCIENCES in French 14 Mar 85 pp 25-27

[Excerpt] Paris--The French aeronautics industry is determined to not allow itself to be "irrevocably outdistanced by the United States" on projects for future heavy cargo propeller planes.

On 7 March, during an AJPAE (Association of Professional Journalists in Aeronautics and Space) debate, manufacturers and engineers indicated that after NASA, the American plane manufacturers Boeing and McDonnell Douglas, and the engine builders General Electric and Pratt and Whitney, France has decided to begin studies on future engines for heavy cargo propeller planes.

The French and Americans are not the only ones to consider a return to propellers. In fact, according to the debate participants, the Soviets have already shown pointed-end eight-blade propellers which appear to be very similar to those currently studied in the west.

The first research in France started around 1978, three years after the American Hamilton Standard (of the United Technologies group, which also owns Pratt and Whitney). The French studies are currently carried out as part of the CHARME program (Propeller Design for Fast Plane for Greater Economy).

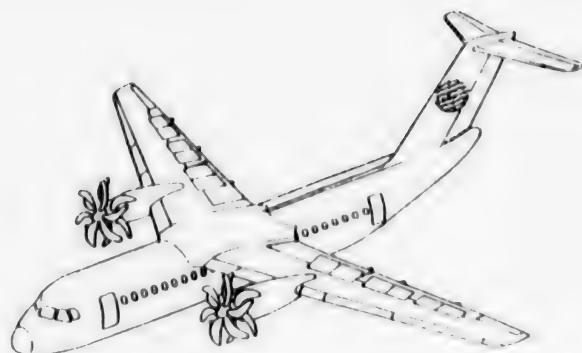
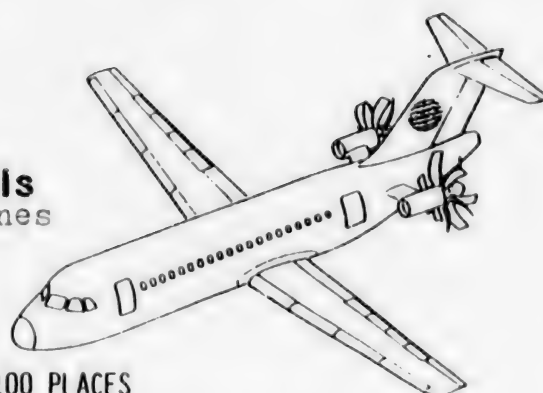
The French government prefers the term "fast plane propeller" instead of the American names Propfan, Freefan, or Unducted Fan (UDF) of General Electric.

The CHARME program, which according to the French manufacturers "is a modest one" compared to those launched in the United States, joins Aerospatiale, Ratier-Figeac (propeller manufacturer), and ONERA (National Office for Aerospace Studies and Research).

A test of a new propeller, perfected in France and consisting of 12 blades, is scheduled for September 1985 in a wind tunnel which will model flight conditions. This test is intended to determine the noise level of this propeller.

Possible configurations

Avions civils Civilian planes



COURT-COURRIER 100 PLACES

M = .72 100-seat short-range courier

PROPFAN AVEC REDUCTEUR 2 x 8000 à 10000 cv

Propfan with 2x reducer 3000
to 10000 hp

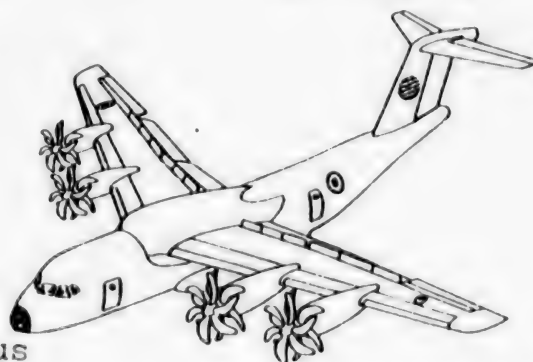
Avions cargos Cargo planes

Cargo planes

LONG RAYON D'ACTION

M = .72 Long distance radius

PROPFAN AVEC REDUCTEUR 4 x 9000 cv Propfan with 4x reducer 9000 hp



CHARME I, in which the French government has invested 40 million francs since 1982, should have ended in 1986, but those in charge of this project believe that it is necessary to conduct further studies and even to become associated with other European partners in Great-Britain, Germany, and Italy.

According to Jacques Rossignol, technical director at SNECMA (National Company for the Study and Construction of Aviation Engines), who does not participate directly in the CHARME program, it is necessary to make preparations at this time for the next technologic advance of the return to propellers, since it will soon not be possible to achieve new technical progress on turbojets.

Jean-Pierre Saint-Girons (Aerospatiale) nevertheless observed that the dates quoted by Boeing and McDonnell Douglas appear optimistic for the certification of a 100-150 seat plane in 1991-1992. According to him, this certification cannot occur before 1995. For Aerospatiale, which believes it necessary to pursue these studies, "it is quite fair for the manufacturers" who have not introduced 150-seat planes competitive with Airbus A 320, "to attempt to confuse the issue."

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CIVIL AVIATION

FRG USES LASER FOR NON-DESTRUCTIVE TESTING IN WIND CANAL

Duesseldorf VDI NACHRICHTEN in German 5 Apr 85 p 16

[Article: "Scattered Light Yields Information: Noninterference Measurements on Airplane Models"]

[Text] Over a period of years, laser technology has been adopted in many areas; lately it has gained a place in wind tunnel measurements. After previous applications mainly with laboratory-scale systems, a larger measurement system was successfully tested recently in the Goettingen wind tunnel of the German Research and Test Establishment for Aeronautics and Astronautics (DFVLR)

The three-component laser doppler anemometer (3-D LDA) will in the future provide aerodynamicists with noncontact and noninterference measurements of stream velocity, for example in testing model airplanes. In contrast to laboratory installations, the large dimensions in the Goettingen wind tunnel require a stand-off of more than two meters from the test article. Since the available laser-light power attenuates very strongly with distance, precision fabrication and assembly of the optical system is required.

In spite of the required measurement sensitivity, system ruggedness must be achieved so that the relatively severe environmental conditions in the large wind tunnel will not make measurements impossible. Thus, for example, a spatial resolution of 0.1 mm must be achieved which means that the entire assembly must have an angular error of less than 0.001 degree. For the optical stream-velocity measurements, no additional--always disruptive--projections or enclosures in the tunnel test section will be required. During measurements, the measurement device aims three laser beam pairs at the flow field to be measured.

The optical system will be used alternately to generate the laser beams which intersect in a common point and to collect the scattered light.

On their way to the model, the laser beams encounter tiny particles (Aerosols) which are transported by the air stream in the wind tunnel. A result is light scattering which, due to the doppler effect, contains the information about the local stream velocity. With the aid of transducer systems the intercepted scattered light is immediately converted into electrical information and stored in computers.

With such on-line measurements the experimenter can read out the gathered data directly as stream velocity. In this process measurement accuracy reaches down into the submillimeter range.

The advantage of this measurement method compared to conventional methods is that not only the average but also the variations of the individual stream velocity components can be determined.

One of the first 3-component measurements in the Goettingen wind tunnel was successfully completed by Goettingen scientists only recently. The accumulated data is of such good quality that follow-on data gathering projects can be planned. The next applications of the 3-D LDA have already been defined. In addition to national tasks in the Nonlaminar Flow (STAB) Project, other measurements at high speeds (to Mach 2) in the transonic wind tunnel are on the program. This relates to the "Vortex Flow Experiment," an international measurement project involving, in addition to the FRG, the Netherlands, Sweden and the United States. Plans have also been made for using the LDA for measurements in the German-Dutch wind tunnel.

9160

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COMPUTERS

OLIVETTI OF ITALY TO INCREASE SHARE IN U.S. FIRM

Munich COMPUTERWOCHE in German 26 Apr 85 p 80

[Article: "Complete Takeover Considered Possible to Reorganize Activities: Olivetti Intends to Increase Its Interest in Docutel"]

[Text] Rome (cw)--With a \$20.2 million investment, Olivetti plans to raise its interest in Docutel/Olivetti Corp. to 54 percent. At present, the parent company owns 46 percent of Docutel.

The provisional decision to acquire the majority interest in this firm, a sales company for Olivetti in the United States, was made after Docutel/Olivetti announced a substantial loss. In 1983, the loss was \$18.3 million; it was \$41.9 million this past fiscal year. Sales are also down: Docutel/Olivetti had a 26 percent drop (from \$221.8 million to \$163.9 million).

In addition to Docutel/Olivetti, American Telephone & Telegraph, New York, also serves as a sales firm for Olivetti products in the U.S. market; in turn, AT&T owns 25 percent of the Italian firm.

Docutel was bought by the Olivetti Corp. of America, then the U.S. marketing firm of the computer manufacturer, for \$55 million. After losses increased, B. J. Meredith, Docutel founder, was replaced by Giovanni Fei, an Olivetti manager.

With the purchase now impending, Olivetti, according to its announcement, considers it necessary to take Docutel/Olivetti completely "under its wing" to be able to reorganize its activities. An Olivetti spokesman said it is also important for future planning "to incorporate the rest of the company to reach its goals."

Since the time of the agreement with AT&T, Olivetti has markedly increased its market activities in the U.S. market. Observers believe that a more aggressive marketing policy should lead to further success. Thus, for example, the value of Olivetti equipment sold to American Telephone & Telegraph in the past year was \$160 million. The Olivetti chairman, Carlo de Benedetti, said that "access to the U.S. market was finally found" through this form of cooperation. To acquire a further market share in the United States, the Ivrea company has set the goal of cooperation with other firms in addition to AT&T, not least also because of further branching out of the sales network.

The Olivetti takeover was made dependent on how the Docutel/Olivetti board of directors and stockholders view it. The board is to first appoint a committee of independent directors to examine the takeover offer in detail and to also include an investment company for advice.

Olivetti let it be understood, however, that no difficulties are expected with this transaction and, based on that, "a fruitful cooperation is possible even within the next two months." However, an agreement is not expected before this summer at Docutel. It depends on when a meeting of the stockholders can be arranged.

Independently of this transaction, Olivetti made an additional investment to retain its 48 percent interest in MicroAge Inc., Tempe. The reason for this was the firm's announcement to seek \$6 million for preferred stock from the private capital market. In addition to Olivetti, other European and U.S. investors also were involved in the funding.

Jeffrey McKeever, MicroAge chairman of the board, said the investment is needed for additional capital to be able to carry out future activities. Present expansion plans include a warehouse with more than 10,000 square meters of space and a store, owned by the company, with almost 750 square meters of usable area. Plans also call for the opening of MicroAge Canada Ltd. Approval from the Canadian government has already been received for this step.

8545

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COMPUTERS

FRG TO USE NEW CYBER 205 SUPERCOMPUTER FOR METEOROLOGY

Duesseldorf VDI NACHRICHTEN in German 5 Apr 85 p 25

[Article by H. Weiss, "Supercomputer Should Reveal Weather Secrets; Computer at Max Planck Institute, Which Cost DM 15 million, Is among the Fastest in the World"]

[Excerpts] After months of export difficulties because of the American ban on exports of high technology products, the large computer for the Hamburg climate researchers at the Max Planck Institute for Meteorology finally arrived on 12 March. Escorted by two police cars, the fastest computer in the world, according to the manufacturer, stowed on three trucks, rolled through downtown Hamburg to the installation site.

Just the day before, the computer arrived in Frankfurt by air from the United States. After assembly is completed in eight weeks, the Cyber 205, the 4th of its kind in the Federal Republic and the 48th in the world, will help climate researchers to mathematically reconstruct weather circulation and identify in good time the effects of civilization on this part of the ecosystem.

The performance of the Cyber 205, which costs DM 15 million and weighs 13 t, is impressive and not just to laymen:

The electronics perform 800 million operations per second thanks to improved parallel processing. Vector processing is the technical term for a process in which the computer can execute in parallel hundreds of individual instructions no longer one after another, but with a single processing step.

The Hamburg weather researchers need this gigantic capacity to obtain a scientific image of the earth's climate from thousands of rapidly changing individual values and then identify possible disturbances in good time.

Several vital programs are on the agenda for 1985 for the supercomputer in basic research in Hamburg. Here are three examples:

--A "planning game" is being used in investigating how the increase of carbon dioxide from stacks and auto exhaust affects our climate--whether, for example, a runaway hothouse effect is making the earth warmer and warmer. The counter model is also being calculated--whether the ever greater dust

emissions into the air will some day lead to insufficient solar radiation reaching the earth and produce a new ice age.

--With other programs, which are possible for the first time on this computer, climatic correlations between oceans and atmosphere can now be analyzed. Of interest here, for example, are especially the effects of disturbances in the gulf stream on our weather. Up to now, for want of computer capacity, the weathermen could alternatively be concerned about either only the air or the water.

- A third focus, finally, will be formation of regional climate models: The "climate image" of a region is stored in the computer; then the consequences of human intervention in the region on the weather can be simulated exemplarily.

The most ambitious goal being pursued by the Hamburg researchers on this computer is forecasting the weather for months or even for several years. Such forecasting would have far-reaching economic consequences even at the very beginning. An icy winter as in this year could then catch us by surprise just as little as the catastrophic drought in the Sahel zone; from planning for a vacation to energy and crop calculation and famine aid, many decisions would be considerably facilitated.

The computer manufacturers will also be complying with this dream of the meteorologists very soon: Control Data (Frankfurt) intends to have a new supercomputer finished already by the end of 1986 which, with twelve times the speed of the Cyber 205, can execute about a billion operations per second. This new computer generation is cooled by liquid nitrogen (-196°C), otherwise it runs hot.

The performance of the current water-cooled supercomputer has already roused fear in the manufacturer's country, the United States, that such a giant could serve the wrong masters. It is on the American government's list of prohibited exports of high-technology products, the CoCom List, and is therefore subject to strict conditions concerning use and security. Each additional export of the system must also be reapproved by the U.S. government.

Two recent incidents have likely caused Washington to be obviously more and more hesitant in giving this approval: Of all places, it was in the Hamburg harbor that the smuggling of a large VAX computer, addressed officially to South Africa, into the Soviet Union was able to be prevented at the last moment at the beginning of 1984. And in a supercomputer center in the United States itself, a visiting Soviet scientist furtively had the computation of new nuclear weapons run on the fast equipment.

The consequences have now also affected the scientists at the Hamburg Max Planck Institute. Since November, the U.S. government had stopped the shipment of the supercomputer already completed in Minneapolis and negotiated on new security measures. The weather researchers finally succeeded in the matter of freedom of science. True, the computer center is being secured, on

a scale already prevalent in the commercial area, with alarms, special locks and access controls; the U.S. request to log all computer runs was however squashed. Wolfgang Sell, the computer center manager, jointly responsible for the allocation of computer time to the individual weather research projects, sees a very effective type of control: "We want to see results from the teams and so within the time allocation for the computer, there is hardly a second remaining for computations extraneous to the subject."

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CSO: 3698/534

FACTORY AUTOMATION

FRG FIRM HAS NEW CONCEPT IN FLEXIBLE AUTOMATION IN PRODUCTION

Duesseldorf VDI NACHRICHTEN in German 19 Apr 85 p 25

[Article by F. Gremm "Flexible Material Flow for the Flexible Factory"]

[Text] A new material flow concept exhibited by Mannesmann Demag Conveyor Engineering at the Hannover Fair will fulfill many requirements of the growing demand for automation in the serial production of small and medium lot sizes. In the concept a driverless transport system (FTS) assures automatic material flow and thus the linking of individual manufacturing cells.

Mannesmann Demag Conveyor Engineering in collaboration with the Institute for Machine Tools and Factory Science at the Technical University of Munich has developed a new concept for flexible automatable production. The new system improves the often unsatisfactory utilization of production facilities and offers a broader economic base for the manufacturing of a generally increasing number of variants of small lot sizes. It also fulfills many requirements of a growing demand for automation in small and medium production runs.

The primary functional units for this flexible automated production method consist of a robot and a computer controlled transport system (FTS), an inductively guided 500-mm high car with a lifting platform. Thereby, the robot--a six-axis, articulated arm unit mounted with its associated control unit on a pallet base--is transported to its work station. Upon arrival at the target work station, the floating-bearing lifting platform of the FTS vehicle makes it possible for the robot to engage the centering cones of a stationary unit and to assume its exact working position. Since there is no rigid connection between the robot and the vehicle, the floor-travelling transport system can return after delivering the robot to other material flow tasks such as the delivery of parts pallets or tools.

Overall, the new solution offers numerous industrial engineering and economic advantages, for example also when compared to fixed base robots in flexible manufacturing and assembly systems. When a robot tends several machines in the conventional arrangement, the circular work space is a critical factor in positioning the machines and for the frequently restricted accessibility. The circular traverse arrangement of necessity degrades material flow. In addition a problem results when manual intervention in a machine is necessary in that the robot has to be turned off for safety reasons and cannot continue to serve the other machines. If, on the other hand, a transportable robot is used, these disadvantages do not result and the machine tools and delivery systems can be arranged to optimize material flow.

The transportable robot also makes possible variable sequences for machine loading. Its application is practical when the machining times are longer than 2 or 3 minutes and a parts buffer is set up, as for instance in machining centers with pallet changers.

Another application is offered when a stationary parts magazine and an integrated handling system belong to a group of machines. In this simple and economical automation concept it is advantageous that the machines work without manual intervention over a limited time span, that sequenced throughput is possible and that one operator tends several machines. Of course the greatest disadvantage with this system is that further automation steps are hard to realize because the stationary parts magazine is fixed in front of the machine and must be manually loaded. Now a transportable robot can take over this task.

A further potential application for the transportable robot is long-time-interval tool changes and expanding on this in the future even retooling operations such as chuck changes on processing machines.

Moreover, for the transportable robot there exists the advantageous potential for teaching in and testing pallet programs in an open space. Only after completing this exercise does the robot--with a perfected program--go to the processing machine. The FTS thus assures automatic material flow and linkage between individual machining cells. A continuous supply of parts to the integrated handling devices or to the machine tools is accomplished. A prerequisite for this is of course the availability of transportable parts carriers; and these must have a definite interface with the transport system, especially with the receiving unit with positioning aids at the transfer station. Since the position of parts cannot be allowed to change even during transportation, some sort of fixturing is required.

The new flexible manufacturing system thus consists of processing machines linked to the automated process consisting of material flow and handling components and a computer system for integrated information processing.

It is expedient to have a hierarchical information structure at the shop floor level emanating from the organizing concept of the manufacturing cells. The hierarchical level and priority level of the intermediate computers are selected for the task at hand. Being shown in the Mannesmann rotunda at the Hannover Fair are the primary functional units of the new system solution, the robot and the FTS vehicle for the flexibly automated production method.

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CS0: 3698/535

FACTORY AUTOMATION

BMFT OF FRG TO FUND LASER TECHNOLOGY RESEARCH

Duesseldorf VDI NACHRICHTEN in German 19 Apr 85 p 55

[Article: "Laser Presents New Opportunities]

[Excerpts] Lasers open up opportunities for production innovations in the most varied branches of industry and revolutionize conventional processes. Within the scope of the subsidy focal point "Physical Technologies," the Bundesminister for Research and Technology is making available funds with which the German laser industry can gain a foothold in international markets. The VDI Technology Center in Duesseldorf is administering the support measures and has assumed the task of establishing the agenda for the BMFT stand in building 7 at the Hannover Fair.

Mastering laser technology at home and satisfying a greater portion of domestic demand for laser sources and components from domestic production are critical for the future competitive position of significant portions of traditional German industrial branches, according to the BMFT. In the future, companies in these branches will have to increasingly apply lasers and laser-based devices in their own production or manufacture and sell these to others in order to secure a place in world markets.

The VDI Technology Center in Duesseldorf is initiating new projects, supervising the development and disseminating the accumulated know-how in order to force the application of the technology in the FRG. For 1985 about DM 15 million is available as support funds. The BMFT plans, starting in 1986, to provide increasing support for laser technology and has accordingly submitted for budget deliberations a request of DM 140 million for the 1986-1989 period.

The objective of the BMFT's R&D funding is to create over the mid to long term a basis in the FRG for an independent laser industry capable of competing in international markets. The Hannover Fair booth in building 7 is already showing supported products and applications examples from German companies.

METALLURGICAL INDUSTRIES

FRENCH COMPANY EXPLORES NEW ALLOYS, POWDER METALLURGY

Paris LE FIGARO in French 3 Jun 85 p 11

[Article by Pierre Kerlouegan]

[Excerpt] The lighter a plane is, the further it can go, or the more passengers it can carry. Weight reduction is thus a constant goal. Thanks to aluminum-lithium, the weight of aircraft will drop even more. But at what price?

No aluminum-lithium plane structure exists to this day, because the manufacturers--Alcoa and Alcan in North America, Pechiney in France--have not yet started industrial production of this material.

From the technical standpoint alone, says Pechiney, nothing stands in the way. In fact, the French company has a prototype furnace with a capacity of one and one-half tons, which it has used to perfect processing and specifications.

Still to be solved are the financial problems for the construction of a foundry planned at Issoire, whose starting production capability will be 3500 tons per year, to be gradually increased to 12,000 tons to satisfy the needs of the aeronautical industry. If Pechiney succeeds in rapidly creating a financing system--200 million francs, followed by 100 million later--the foundry will be operating within two years.

Aluminum-lithium is therefore for the future. And then what?

For Jean-Pierre Ergas, director general of Cegedur-Pechiney, it already appears that powder metallurgy could be one of significant technologic innovations of the next decade.

"Our customers, manufacturers in the aeronautics and space sector, are more and more demanding," he explains. "Tomorrow's materials will thus have to have higher characteristic specifications, and withstand higher temperatures, abrasion, and corrosion. But ingot metallurgy is limited in the light of these difficult requirements; it allows, for instance, only a slight solubility of additives in aluminum. To escape this constraint, powder metallurgy appears as one of the most promising approaches."

The Powder Approach

The results obtained at the Voreppe (Isere) research center, have led Pechiney to push the development of this new metallurgy, concluding with the construction of a second powder-alloy manufacturing unit at Hermillon (Savoie), which will be in operation at the end of this year.

While the weight drop in structures is sometimes measured in tons, one must not overlook additional reductions which are only expressed in kilograms. By substituting aluminum for copper in the production of electric cables, Pechiney thus reduces their weight by 45 percent.

The French-Italian plane ATR 42, which will start service in autumn, carries 230 meters of nickel-plated aluminum wire, for a loss of 12 kg. A modest result to be sure, but it is by reducing such weights on various pieces of equipment that it becomes possible to transport several extra passengers.

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CSO: 3698/554

MICROELECTRONICS

THOMSON STRATEGY INCLUDES INCREASING GATE-ARRAY MARKET SHARE

Heidelberg ELEKTRONIK INDUSTRIE in German No 4, 1985 p 104

[Article: "Thomson Semiconductors Pushing Gate Arrays"]

[Text] "In addition to standard IC's, microprocessors and storage systems for specific applications, gate arrays are now one of the focal points in Thomson's strategy which is aimed at increasing its world market share in the semiconductor business from the present 1 percent to 3 percent." Thus declared Dipl Engr Andreas Barth in a conversation with our editor-in-chief. As of recently Barth has, together with the long-time chief, Igor Dorochevsky, been second business manager of the Thomson CSF Component Company, Inc. Moreover, he is in charge of the semiconductor division and is responsible for the central European market. In his statement he not only confirms the plans recently announced by vice president Jacques Noels, but he can also point to initial successes on the basis of preliminary accounting figures for 1984. With a growth of 40 percent in the world semiconductor market it has been possible for Thomson semiconductors to increase its sales by 67 percent. As much as 30 percent of its profits were obtained outside Europe, preponderantly in the United States and in east Asia. In 1982 exports in this latter region amounted to only 10 percent.

With respect to gate arrays Thomson can offer two important plus points: on the one hand not only are customer-specific forms of integration designed in close-to-customer design centers, but also the arrays themselves are developed and manufactured in Europe. On the other hand, a mutual second-supplier agreement with Oki assures additional security to the customers. Production in Grenoble permits in critical cases a direct contact between the customer and the factory specialist without great expense. The need for such contact always exists even when normally the user finds competent consultation and support in the local development center throughout the entire development phase. For customers in Germany Thomson has set up a design center in Munich which operates through a permanent link directly with VAX computers in the Grenoble plant. In addition, this year the design center is being expanded with "Daisy" work stations and in 1986 will be equipped with its own VAX.

At Thomson there are available gate arrays in ECL technology and in CMOS technology. Since 1983 there have existed 3-micron CMOS types having 360 to 1,458 gates and one level of connection, while since last fall there have been types

having from 1,440 to 4,025 gates and two interconnection levels. Designs in 2-micron geometry with up to 6,000 gates will also be available this year and by the beginning of 1986 there will be types available with up to 8,000 gates. The types obtainable at the present time can work with switching frequencies up to 50 MHz and have CMOS-compatible or TTL-compatible connections.

ECL gate arrays with 500 and 1,000 gates have delay times of 1.2 nsec; versions with 1,200 and 1,700 gates have 800 psec and operate up to 250 MHz. They can be provided with ECL-compatible and/or TTL-compatible input and output cells. For all families Thomson has a complete CAD development system with a comprehensive cell library. The interface between user and design center can be set at any level desired by the user. The customer, depending upon his experience and his equipment, can provide Thomson with nothing but a product specification or he can provide the logic diagram or the entire layout or the finished mask.

In addition, Thomson semiconductors offers a family of analog arrays. Polyuse arrays can substantially reduce development time for special analog circuits. In a technology with $U_{CE0} = 16$ volts and $f_T = 550$ MHz (for the npn transistors) there are available arrays having 71-npn, 35-pnp transistors and 310 resistors as well as with twice this number of components. Additional arrays have a high limiting frequency of $f_T = 2$ GHz at $U_{CE0} = 20$ volts or a high dielectric strength of U_{CE0} at $f_T = 250$ MHz.

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CSO: 3698/497

SCIENTIFIC AND INDUSTRIAL POLICY

FRG MID-LEVEL FIRMS HURT BY RIESENHUBER'S BUDGETING POLICIES

Munich INDUSTRIEMAGAZIN in German 15 Mar 85 pp 36-37

[Article: "Support for Research: Lovely Deception"]

[Text] Despite his words to the contrary BMFT (Federal Ministry for Research and Technology) Minister Riesenhuber is systematically reducing support for innovation in small and medium-sized enterprises. The large research facilities are his first love.

The man in the bow tie is not at all surprised when he is celebrated by part of the press as the valedictorian of Helmut Kohl's cabinet. The minister for research and technology, Heinz Riesenhuber, thinks that he and his policies are "reasonable"--and he is good at selling the idea.

Superstar Riesenhuber, as the restorer of the market economy--"The FRG government has again improved overall market-economy related conditions for research and development," were his words of praise recently regarding continuation of the cost subsidies for R&D personnel and his "support for expansion" for new hirings.

Riesenhuber as a patron of small and medium-sized businesses--"The measures decided upon will enable small and medium-sized enterprises in particular to obtain the technical and scientific knowledge which will be required for the products and processes, and thus the markets, of the future."

Riesenhuber as a foe of bureaucracy--"The new special deductions for R&D investments are of great importance because they improve a company's innovative capability without administrative expense."

For two years this degreed chemist and experienced company manager, now heading the BMFT, reaped praise and encouragement from the economic sector for his eloquent statements. In the meantime, after concrete experiences with Riesenhuber's programs, it is dawning on many companies that, "The best thing about the minister of research is his PR"--this according to the chairman of the ASU (Working Group of Independent Businessmen), Martin Leicht. On closer inspection, Riesenhuber's good deeds all too often turn out to be well-concealed cutbacks in customary state aid.

One example is cost subsidies for personnel. Since 1979 the government has been supporting the R&D activities of small and medium-sized companies through the budget of the economic ministry by subsidizing their costs for R&D personnel. After an initial slow start--in the first year only 1400 companies took advantage of the DM 300 million pot--this aid program became a hit. In 1984 alone nearly 11,000 small and medium-sized companies applied for the 40 percent subsidy (a maximum of DM 120,000 annually). Demand increased many times over, but budget entries scarcely changed at all. This large number of companies was only able to receive some assistance because the economic ministry each year obtained funds from the next year's budget. When the backlog had grown to DM 200 million, the budget committee in the Bundestag pulled the emergency brake: The funds for 1985 were limited to DM 380 million and for 1986 to 1988 to DM 400 million, even though DM 500 million would be required annually. After that there will be no more.

In order to bring demand down to the level of the available funds, Riesenhuber and his colleague in the economic ministry, Martin Bangemann, combined their efforts. What the minister of research calls "an improved overall regulatory climate for small and medium-sized firms" is in reality "a drastically decline," in the view of Juergen Schulte-Hillen, a technology consultant in Cologne.

In fact, in view of the new guidelines many small companies find it no longer worth the bureaucratic effort to try to obtain those few marks from the government till.

For one thing, companies which have already taken advantage of the cost subsidy for personnel five times are reimbursed for only 25 percent rather than 40 percent of their R&D wages and salaries. Moreover, companies which are entitled to apply for the subsidies (with less than DM 50 million in turnover and fewer than 500 employees) are entitled to only half the standard subsidy amount for their "scientific auxiliary personnel," meaning laborers, master craftsmen or laboratory assistants employed in the research department.

In an extreme case, says Schulte-Hillen, a small enterprise in which a master craftsman does the development work receives only 12.5 percent of the master craftsman's wage in the sixth year. "Instead of DM 24,000 annually, it would in the future be only about DM 7500," calculates the consultant from Cologne.

/Weakening effect/ [in boldface]. The "support for expansion" brought into being by Riesenhuber also changes nothing in this regard. With this new research subsidy the minister would like to force expansion of the personnel within development departments--unless the EC prohibits subsidy-itis.

Companies with turnover up to DM 300 million and fewer than 3000 employees will receive 60 percent of the gross salary (up to DM 300,000 per year) for 15 months for additional researchers and scientists hired during the period between 1 September 1984 and 31 December 1987. Riesenhuber has made available DM 55 million for this purpose for 1985, DM 145 million for 1986 and DM 155 million for 1987 and 1988 respectively.

Due to the short support period experts suspect that Riesenhuber's millions will first of all weaken demand. Larger companies will apply for BMFT money for the new hirings they already have planned; small firms will not be able to afford additional personnel even with this subsidy because after 15 months they would have to bear the cost alone.

/Misjudged/ [in boldface]. Their abstinence suits the minister just fine because otherwise the limited funds would not be adequate. Even though his "support for expansion" program has wide latitude with its DM 300 million turnover limit, software companies, in addition to production companies, will finally be allowed to participate in the two support programs for the first time as of 1985. Riesenhuber developed the idea based on 200 software firms applying for subsidies. But Schulte-Hillen alone has already had requests from more than 100 companies for assistance in filling out the applications. He also estimates that "at least 2000 software companies will line up for part of the BMFT's pot."

But because the funds are most certainly not to be increased, another cap will probably soon be placed on the subsidies. Schulte-Hillen therefore thought it more reasonable to lower the limit on turnover size in order to at least give small and financially weak businesses some effective aid for innovation.

Examples are special deductions and investment allowances for R&D investments. Doubts about official friendly intentions toward small and medium-sized businesses are also creeping up on companies regarding indirect support in the form of deductions and grants for building or expanding research facilities or for developing products and processes, a program which has been praised as being market oriented and unbureaucratic.

It is true that in this area there are no time-consuming and extensive application and testing procedures at agencies, or consultations by scientific experts. "But because tax officials do not understand the relevant laws and have no concept of research and development," says Schulte-Hillen, often enough deductions are not accepted and allowances are not paid. The tax office refused the investment allowance for a newly developed, more efficient manufacturing process with the following justification: "There are no substantial changes over the products produced up to now--the same products could be produced without this machine, although at greater expense." According to Schulte-Hillen, the officials had overlooked the fact that not just producing new products but also developing improved machines for producing them is worthy of support.

The number games played by the respective ministers in distributing their funds is evidence of the discrepancy between what is and what appears to be the case regarding support for research in small and medium-sized firms. Only at the end of last year did Riesenhuber break down the figures to reveal that small and medium-sized firms received 26.8 percent of all civil support money from the government and that that was twice as high as what these companies themselves contributed to research efforts within the economy.

Riesenhuber forgot to mention that the figures were taken from the past. He included payments from programs which his predecessors initiated, which were made last year and which have since been cut.

/Preferential treatment/ [in boldface]. "Support specifically for small and medium-sized businesses is drying up," observes also Karl-Ludwig Ostermann, general manager of the Working Group of Industrial Research Associations in Cologne. Despite what he says Riesenhuber is in any case submitting mini-programs for those cut, such as his recent support for microperipherals, sensor technology and for further development of solar cell technology (DM 300 and 375 million until 1989).

Riesenhuber's real love is reserved for the large research facilities in the nuclear field, basic research, aviation and space flight and materials research. Moreover, he hopes that scientists at the research institutes will begin to support themselves with their own inventions and with the aid of venture capital. Not only is he supplying state money to founders of companies--money lenders in the venture capital companies are also profiting from the research subsidies. They receive an expense allowance from the state for the in-depth economic feasibility studies of potential new enterprises, which they conduct in order to minimize their own risks. All too much risk, then, is not really involved.

"In principle," says ASU member and small businessman Leicht, "we have just as few objections to halting subsidies which have become more popular as we do to such unnecessary state aid." However, continues Leicht, "Instead of redistributing money, the government should lower taxes so that we can pay for research out of our own profits."

That would finally be indirect support in its purest form.

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SCIENTIFIC AND INDUSTRIAL POLICY

FRG BUSINESSES ANXIOUS ABOUT NEW TAX REGULATIONS

Munich INDUSTRIEMAGAZIN in German 15 Mar 85 pp 44-45

[Article: "Tax Controls. The Perfect Mousetrap"]

[Text] The West German federal government wants to perfect its supervision over its taxpayers with new regulations. Experts already fear an "Orwellian surveillance state."

The long arm of the tax authorities already reaches into the last private and commercial recesses of West Germany's homes and businesses. The taxpayer is required to provide, completely and accurately, the vast amount of information needed for determining his taxes. The tax office knows an individual's situation in life and his wealth, as well as what is involved in his company's books, bank accounts and foreign transactions, and can explore every corner of a company during a tax audit. And finally, it can--in a tax investigation--examine bank accounts and other agencies and even investigate one's business partners.

However, this was still not enough for the federal government. If the government had had its way, we would already have taken a big step toward total tax-related surveillance of every FRG citizen by the first of this year. It was already planned for the 1985 revision of the tax law--in force since January 1--that all agencies be required to supply information to the tax office unsolicited. In addition, the exchange of information between the various EC tax offices was to be intensified within the scope of EC administrative aid.

However, the finance committee within the Bundestag had second thoughts. "The committee would like to look at this sensitive area more closely in order to come to the most carefully considered conclusion possible," said the committee's concluding report. Whether the "Orwellian surveillance state," as economic experts call it, will become a reality in 1986 is currently under intense scrutiny.

The new paragraph 93a of the tax code will then empower the federal government to enact that law, which is already assumed to lie on the desk of Dr Adalbert Uelner, department head at the federal ministry of finance. According to this law all agencies and broadcasting corporations can be required to provide tax

offices with more or less regular information--so-called spontaneous information--on events and facts which may have tax-related significance.

Trivial matters (small repair jobs for example), however, are not to be reported. Professional associations and publicly-owned commercial enterprises (e.g. municipal utility companies and transport services) are exempt from having to supply information, as are credit institutions, insurance companies and the postal service (on its checking and savings accounts).

Despite the exceptions it is hardly surprising that the economic sector is sharply criticizing this bill. According to the BDI (Federation of German Industries), Bonn's plans would stand the previous information-gathering system completely on its head. The ruling would proceed from a basic attitude of distrust rather than trust.

The search for the last sources of tax revenue is on the agenda, apparently not just at the national level but also within the EC. With the EC administrative aid law the FRG government is also complying with a Brussels guideline.

According to this guideline all of the EC nations are obligated to exchange information across national borders concerning tax-related cases. This concerns not just information requested by the tax authorities in another member nation. In cases where tax evasion at the expense of another EC nation is suspected or where business dealings are being handled through third countries to avoid taxation, information should--not yet must--be supplied unsolicited.

Furthermore, dealings which are between closely associated persons and which are related to tax concessions and profit limits--if transacted across national boundaries--are to be monitored. However, if existing regulations or double taxation agreements contradict such action, the authorities may not exchange information.

The following provision shows what businesses are threatened with: An exchange of information shall not take place if the national parties involved would suffer damages due to the revelation of company secrets. For one thing, however, that country's tax office must recognize the possible consequences of its actions. And for another, tax secrecy is not nearly as watertight in other places as it is in the FRG.

Another danger is that with two separate sets of information the same tax case can be subject to double jeopardy. As early as 1976 the EC commission suggested arbitration proceedings, but because the council of ministers could not reach an agreement on it the administrative aid law is to be implemented without this procedure. Companies themselves must thus put up their own defense against double taxation.

According to industrial lawyers these proposed regulations are at odds with constitutional law. In its judgment on the census the Federal Constitutional Court created the term "informational self-determination." According to its definition all agencies which collect data on individuals must limit the

release of that information to the minimum necessary for a particular purpose. And this purpose must be defined by law, something which has not yet been provided for in the tax law revision.

Finally, it at least appears doubtful whether the attempt to close up the loopholes in the surveillance system will be successful. Waltrud Will-Feld, CDU deputy in the Bundestag, commented, "Whoever builds an ideal mousetrap can count on the next generation of mice being naturally smarter."

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SCIENTIFIC AND INDUSTRIAL POLICY

NEW BRITISH POLICY AIMS AT COMMERCIALIZATION OF RESEARCH

Paris AFP SCIENCES in French 23 May 85 pp 11-12

[Text] London--The British government has decided to derive the highest commercial value from the results of public research, by making it possible for researchers and their organizations to obtain patents and sell their inventions directly to the private sector, or to create subsidiaries which would assume responsibility for them.

The announcement of these changes in the British policy on these matters, which until now gave research councils the right to determine the exploitation of an invention or technique, was made on 14 May by Sir Keith Joseph, education secretary, in a written answer to the question raised by Patrick Thompson, Commons member from North Northwich.

Sir Keith took the opportunity to point out that in 1985-1986 the British government was going to spend 560 million pounds in subsidies for the five large research councils (Agricultural and Food Research Council, Economic and Social Research Council, Medical Research Council, Natural Environment Council, and Science and Engineering Research Council).

Given the importance of research for the United Kingdom, Sir Keith added, the government has considered allocating an additional 18 million pounds over three years during 1985-1988 to improve research equipment in high quality university research centers, and about 27 million pounds to the science budget to facilitate the restructuring and reassignment of the research councils, and to finance other subsidies for advanced research.

"The great objectives of the new decisions must improve the commercialization of public research for the benefit of the British economy," emphasized Sir Keith.

"We want researchers to be very aware of the possibilities for exploiting their work, to be ready to perceive and share the profits of this exploitation both for themselves and in the national interest, and to ultimately have the opportunity of carrying it out for themselves."

The five research councils mentioned above, finance about 6900 research projects representing a total value of 360 million pounds. The councils wanted to have exploitation rights and responsibilities for the projects they finance, and the universities to keep them. Consequently, the chairman of the Science and Engineering Research Council will ask the universities to make proposals for the transfer of exploitation rights and responsibilities.

"I hope that in formulating their proposals, the universities will seek to give researchers the best opportunities to exploit their own work, ...but since public funds are involved, the universities will have to collect royalties and report on the commercialization of the exploited research," added Sir Keith.

Circumstances could exist in which a researcher or university will find or have to work with a foreign company or its subsidiary to exploit an invention. In this case, whatever agreement is reached will have to be submitted for approval by the Ministry of Trade and Industry, and the annual report of the universities involved will mention any agreement reached with such companies.

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SCIENTIFIC AND INDUSTRIAL POLICY

REPORT LAYS OUT HIGH-TECH GROWTH FOR RHEINLAND-PFALZ

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 11 Jun 85 p 2

[Text] In the future, the universities of Mainz and Kaiserslautern will play an important role in the effort of the Rheinland-Pfalz government to promote technological development of the Land. On Monday, at the official handing over of a report on the subject "Competitiveness and Employment," which was prepared by a commission of experts under the leadership of Kaiserslautern university teacher Ehrhardt, Minister President Vogel stated in Mainz that the strengthening of competitiveness of Rheinland-Pfalz businesses and job security depended to a large degree on the extent to which new key technologies can be used, further developed and rapidly turned into new products and production processes. Vogel mentioned as priorities, already to be stressed in the coming budget years 1986-87, the expansion of materials science in Kaiserslautern and Mainz; development of microelectronics and biotechnology in Kaiserslautern; and creation of research emphasizing natural sciences and medicine in Mainz. The university in Trier, with its orientation toward the humanities, is to expand the field of "control of environment and technology," and specialized institutes of technology are to strengthen practical research in the sectors of computer and ceramics technology. In view of the growing importance of ceramic materials, Rheinland-Pfalz will participate in building in Coblenz a development center oriented towards practical application.

The report listed six "growth fields" in which the Land should get involved.

1. Production technology. The recommendation is to combine research in micromechanics in Kaiserslautern and to build on the activities already existing there in the areas of solid-state technology and materials science. This is to speed up transfer of existing knowledge on automation and computer-integrated, flexible production systems into industrial practice.
2. Measuring, regulating and control engineering. The recommendation is to promote, through decentralized individual projects, the development of improved diagnostic and analytic systems, for instance in medical technology and in environmental and energy technology. Establishing a supra-regional service laboratory in Kaiserslautern for surface and thin-layer analysis with instruments is proposed, as is founding a promoting association by and for

firms with a particular interest in measuring, regulating and control technology. One of the tasks of this association is to be the intensification of cooperation of medium-sized industry with institutes of technology in these technical areas.

3. Information technology, microelectronics, industrial and administrative computer science. The recommendation is to give students of electronic engineering the chance to design and produce integrated components during their training period. In Kaiserslautern, the emphasis is to be on "microelectronics and information technology," which can build on existing beginnings (particularly the special research area of design methods and parallelism) in the sectors of electro-technology and computer science. Together with industry, an information center is to be established with an adjunct demonstration laboratory in the field of "Computer Aided Design" of "Very Large Scale Integration" components. A central subject is to be the design of customized components. In Trier, research is to be initiated on organizational measures for effective use of new information and communications technology, and in Kaiserslautern research is to be expanded in the use of data bank systems, artificial intelligence and expert systems in the field of industrial and administrative computer science.

Developments for Efficient Energy Use

4. Materials engineering. Creation of centers for materials science is recommended for Kaiserlautern and Mainz. Preferably, Kaiserslautern is to work in the areas of metallic and inorganic nonmetallic materials, while Mainz is to deal with polymers and composite materials. Envisioned is an institute for materials science with emphasis on the field of composite materials. The experts demand support of plans for expanding the Max-Planck-Institute for Polymer Research in Mainz by two additional departments for "processing technology of polymers" and "macromolecular chemistry relating to preparations."

5. Chemistry and biology. It is recommended to establish a technology center in Mainz, also, as is being built in Kaiserslautern. Thereby, knowledge and installations could be used which exist in institutes of technology and in industry in the special fields of polymer science, chemistry, physics, biology and medicine with a view to highly processed materials with special characteristics. At the University of Kaiserslautern, biotechnological research in the direction of microbiological and plant biotechnology is to be strengthened through establishing a department of genetics (with emphasis on micro-organisms or plants), and the existing research capacities in microbiology and biotechnology are to be emphasized. Close scientific contacts are to be promoted with the Federal Research Institute for Viticulture, the Land, teaching and research institutes, agricultural testing stations, and the University of Mainz. For Mainz, the experts propose a "natural sciences-medical research center." The center is to deal with the molecular aspects of structure and function of biologically active systems, on an interdisciplinary basis.

6. Environmental and energy control. In this field, the recommendation is for development of more efficient energy use, and production processes which save resources and lessen dangers to the environment. The experts seem to consider promotion of individual projects as the most suitable way. As an example, they have in mind joint research in the fields of exhaust air and waste treatment. The special institute of technology could also become involved in this.

The experts in Rheinland-Pfalz take a critical view of the lag in scientific, research and development installations. But they point out that the Land offers location advantages for the establishment of new research institutions. They recommend strengthening students' interest in technology and their initiative to address technical questions through special incentives such as competitions and awards for particular achievements, and to maintain the teaching of the entire spectrum of natural sciences in the schools. The teaching curriculum should be better adapted to new technical developments than previously. The federal government is asked to increase its share of indirect research support for industry.

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SCIENTIFIC AND INDUSTRIAL POLICY

EUROPEANS MOVE TOWARD CONCERTED EFFORT ON EUREKA PROJECT

Matra, Norsk Data Agreement

Paris L'HUMANITE in French 25 Jun 85 p 9

[Article by Julien Pierre]

[Text] The French group Matra signs an agreement with Norsk Data as part of space militarization.

Matra and Norsk Data have just signed in Oslo the first European contract of the Eureka program. It concerns the joint construction of a supercomputer. On the other hand, agreements between Bull and Siemens, and between Cilas (CGE) and Selenia, could also be concluded. In FRG, the government has just given its official approval to Eureka. As the Milan summit draws near, Europe, led by France, increases its participation in Reagan's military-industrial projects.

Several days before the European summit in Milan, Matra and Norsk Data, a Norwegian company, announced the signing of the first European contract as part of the Eureka program. The agreement covers the joint construction of a compact vector computer. This supercomputer should see the light of day in three years.

Matra's presence among the first two European signers of a contract under the Eureka umbrella, is particularly significant. J.-L. Lagardere, Matra's CEO, has been congratulating himself ever since the beginning of the Eureka program, as well as of the American Star Wars (IDS) program. He was even one of the first to openly acknowledge the "complementarity" of the French government's Eureka program and Reagan's IDS, during a press conference held at the Bourget Salon.

At the signing of the agreement with Norsk Data, he in fact continued to deny any conflict between the two programs, and illustrated in his way what Francois Mitterand himself had indicated by declaring that "bridges and paths could be laid between Eureka and IDS." He indeed disclosed that "companies on the other side of the Atlantic, specialized in artificial intelligence, are

already interested in our vector computer." And everyone knows that artificial intelligence is one of the technical fields involved in Star Wars, thus being abundantly sprinkled by the \$26 billion which President Reagan intends to allocate to this program over a five-year period, even if it means that the drain on Europe and the third world will be increased.

It is equally interesting to note that Matra and Norsk Data have already been partners since October 1984, and that in this guise, they will soon introduce a microcomputer, which appears to be no more than a simple adaptation of Norsk Data's ND 500 super minicomputer. Will the Norwegian company's domination be as strong in the agreement that has just been signed? In any case, the race for the Eureka and IDS markets does not open for our country the path to greater technologic power, as it would appear from the official speech.

In fact, as the Milan summit comes closer, we are seeing renewed pressure to draw Europe more deeply into the IDS wake. Fascinated by the enormous amounts which Reagan intends to commit to this business, the appetites of American and French companies are becoming sharper. In France and Europe, the directors of these companies are increasingly taking the position that it would be crazy to bypass these juicy markets. In this light, Francois Mitterand's initiative appears more clearly as what it is: a means to organize European participation in Reagan's military projects.

The military aspect is now acknowledged even in official declarations. Present at the signing of the Matra-Norsk Data contract, H. Curien, minister of research, declared this about Eureka's financing: "The government devotes 10 billion francs per year to the fields covered by Eureka. It will continue to concentrate these resources on this program in two ways: financial aid, and the opening of public--eventually military--markets."

Other agreements could occur quite rapidly as part of Eureka, maybe even at the Milan summit. There is talk of a Bull-Siemens agreement on very high power computers, and of another one between Cilas, a CGE subsidiary, and the Italian company Selenia, on industrial lasers. The government and the French company are thus rushing headlong into a frantic armaments race led by Reagan.

Electronics Giants Favorable

Paris LE MONDE in French 27 Jun 85 p 8

[Article by Eric le Boucher]

[Text] Eureka is beginning to very seriously interest the industry. After Matra and the Norwegian company Norsk Data, which at the end of last week agreed to cooperate on vector computers (LE MONDE of 22 June), Europe's four largest electronic companies have published a joint statement of intention, favorable to the initiative started by Mr Mitterand two months ago for technologic Europe.

Netherland's Philips, Germany's Siemens, France's Thomson, and Great-Britain's General Electric (GEC), "consider that the Eureka program must mobilize the European research potential on a small number of projects designed to encourage the development of equipment and systems likely to find both civilian and military commercial outlets and applications." They will examine the various aspects of the planned cooperation and will commit themselves "within the six months following a decision from the governments to launch Eureka."

For these companies, future markets depend on "strategic components" on which the effort must be focused, which will be advanced microprocessors (called Europrocessors), fast integrated circuits and gallium arsenide, microwave components, high-density memories, flat panel displays, and "sensors" of all types.

On the eve of the 29 [as published] and 29 June Milan summit, the reinforcement provided by these four leaders is significant. In electronics, Philips, Siemens, Thomson, and GEC represent cumulated revenues of nearly \$35 billion, and a share of 12 percent of the world's military electronics market, 9.6 percent of the components, and over 14 percent of all consumer goods (TV, HIFI, and so on).

These companies are actually not the only ones interested in Eureka. In Milan, Mr Mitterand should be distributing to his colleagues a White Paper about the program, prepared in Paris by CESTA (Center for the Study of Advanced Systems and Technologies), which will contain a list of existing inter-industrial collaboration projects. These projects cover about a dozen topics, which range from vector computers to seeds, with insulin pumps and power lasers in between. All in all, dozens of European companies have already reacted and are ready to participate.

"Show me!" is the clear message they are sending to the governments. They hope that the latter will not stop at intentions but will move fast, given Europe's delay and the need for urgent decisions. "Show me!" But only as long as the projects are finalized (ending up in products), financing is available (no reassignment of appropriations that are already committed), and the structures of organizations to be established in Milan are not bureaucratic.

Once the topics have been disclosed, the manufacturers are known, and the structures are defined, there remains the question of money. The feeling in Paris is that public appropriations will be needed for a "fast start." Bonn appears to be of the same opinion. But after that, nothing prevents bankers from participating in the financing of these projects, since they must rapidly end up in commercial income. The British and the Germans, it is said in Paris, are very favorably inclined toward the participation of banking or any other private money in technologic Europe.

Two months after its launching by Mr Mitterand, Eureka seems to be a real, and frankly unexpected success. It is as if in their hearts, the European manufacturers were waiting only for an initiative, a trigger such as this. They must not be disillusioned in Milan.

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SCIENTIFIC AND INDUSTRIAL POLICY

NETHERLANDS PAPER PERCEIVES PITFALLS FOR EUREKA SCHEME

PM221245 Amsterdam DE VOLKSKRANT in Dutch 19 Jul 85 p 3

[Editorial: "Eureka"]

[Text] Eureka, old Archimedes' cry of joy, is now the formula for technological cooperation in Europe that has been accepted by 17 nations. This cooperation is undoubtedly necessary, but whether Eureka is such a lucky find for the EEC is open to question.

Technological cooperation is becoming more a matter for national states and industries and thus less a motor for European integration. Eureka could even lead to a slow breakup of the EEC, because cooperation on technological development threatens to become a matter for countries which have power, money, and know-how. Poorer countries with less well developed industries and less expertise could easily opt out.

The fact that the European Commission will proceed further with its proposals for a technological community is poor consolation.

Because the European heads of state and government were unable to make a clear choice between the French Eureka project and the wide-ranging proposals of the Commission a couple of weeks ago in Milan, they gave both plans their blessing. The result is that Europe now has two cooperation projects involving primarily the same countries and covering the same technological fields.

Whether the technological community, if it comes about, and Eureka, for which the starting signal was given in Paris yesterday, really will complement and reinforce each other as the optimists contend is highly uncertain. The scarce funds can only be used once. It is therefore more probable that Eureka and the technological community will become rivals.

And because the Eureka project will probably pay the member nations poorly for the projects from which their own industries will profit, these countries will be very greatly tempted to make a thriftier contribution to the EEC. The European commission has pointed out that a technological community will require not less, but considerably more money.

The attitude of the Dutch Government remains vague. The EEC is of the greatest importance to the Dutch economy. It seems unwise for this reason that the Hague has avoided a clear choice and is advocating a link between Eureka and a technological community which in practice will probably not work.

The French idea behind Eureka--to ensure Europe's independence in the technological field especially now that the United States is after European know-how through its star wars program--is undoubtedly correct. But it is a pity that Paris wants to keep Eureka outside the EEC as much as possible.

The argument that bureaucracy must be avoided and that the system must be able to function supplely is quite understandable at first sight. But it still has to be proved that 17 European nations are quicker and more efficient than the--admittedly--slow-moving community of the ten, soon to be the twelve. Experience teaches that the problems begin with the concrete realization of good ideas.

CSO: 3698/593

SCIENTIFIC AND INDUSTRIAL POLICY

BRIEFS

SWISS R&D FINANCING--Geneva--A study published by the Swiss Employers Associations (VORORT) discloses that Switzerland has devoted nearly 4.8 billion Swiss francs (FS) (1 FS = about 3.6 French francs) to research and development in 1983, three-fourths of which were financed by the private sector and one-quarter by the government. The distribution of the funds allocated for research is: 72 percent (3.4 billion FS) for the private economy, 17 percent (82 million) [as published] for universities, 5 percent (236 million) for various federal agencies, 3 percent (148 million) for non-profit private institutions and laboratories, and 2.5 percent (119 million) for international organizations. [Text] [Paris AFP SCIENCES in French 23 May 85 p 15] 11,023

EC AID FOR FRG ESPRIT PROGRAMS--Brussels--The European Commission (EC) has authorized public subsidies of 2.43 billion DM (about 7.3 billion French francs) in FRG, for the development of information technologies. In an announcement made public on 28 May, the commission indicated that this support, spanning the period of 1984 to 1988, was approved by the FRG Ministry of Research and Technology (BMFT) for research and development programs (microelectronics, computerization, telecommunication techniques) falling within the framework of the Esprit EC program for information technology. The investments necessary in this sector "normally present a degree of high technical and economic risk which is not easily supported by an individual enterprise," states the commission. Moreover, this sector is subjected to the pressure of American and Japanese competition, it added. [Text] [Paris AFP SCIENCES in French 30 May 85 p 2] 11,023

NO FUNDS FOR SDI, EUREKA--Bonn, 9 Jul--Research Minister Heinz Riesennhuber (CDU) does not have the funds in his 1986 budget for the European technological cooperation project (Eureka) that has been proposed by France. Riesennhuber said that his funds were "fully spoken for." If greater amounts are needed for Eureka in 1986, the finance minister must allocate additional funds, he said. According to Riesennhuber, the U.S. Strategic Defense Initiative (SDI) does not threaten to place a burden on his budget. This project "is not" included in the Research Ministry's budget, he stressed. The minister objected to the charge by the SPD opposition in the Bundestag that he has restricted his financial leeway to too great a degree by participating in expensive space research programs, such as the Ariane V. booster and the U.S. space shuttle, Columbus. [Excerpt] [Frankfurt/Main FRANKFURTER RUNDSCHAU in German 10 Jul 85 p 6 DW]

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TECHNOLOGY TRANSFER

SCIENTISTS AT DUTCH UNIVERSITIES LINKED BY COMPUTERS

Rijswijk PT AKTUEEL in Dutch 27 Mar 85 p 1

[Article: "Coupling of University Computer Centers Promotes Money Flow and Efficiency"]

[Excerpts] Yesterday, DR R.J. in 't Veld, director general of Higher and Scientific Research, officially opened the CONUEX computer network at Erasmus University. This network provides a connection among the computer centers of Erasmus University, the Catholic College of Tilburg [KHT] and the State University of Limburg [RL]. The network enables the users -- primarily scientific researchers -- to communicate with one another's computers as if they were their own systems. That works more efficiently, but furthermore such cooperation is financially valued by the authorities and that is a welcome change in a time of economizing.

The new cooperation among these universities is to a large extent the result of the so-called retrenchment operation in terms of task distribution and concentration of the Ministry of Education and Sciences. In 1983, this ministry stated that standardization of equipment and specialization in terms of specific provisions could produce substantial savings. In January 1984, the Data Processing Stimulation plan stated that a limited number of university computer centers would be allowed to grow into so-called "key data processing centers" which would have to provide their services on a national basis. In addition to savings and standardization, the concentration of the computer centers should lead to a communication network and for universities that is naturally the most important factor. As a matter of fact, a network makes it possible to use one another's files, and that means that there is much less need for duplication, which could in principle benefit the quality of the (research) work.

Beta [courses in exact sciences at Dutch universities] components produce money. However, the government's retrenchment policy has worked as a catalyst, even though the various parties had not yet lost heart in the meantime. Contacts had already been made in 1983 between Rotterdam, Maastricht and Tilburg, which benefited from the fact that all these institutions had digital equipment at their disposal; hence, a coupling of the computer centers was bound to happen. There was the additional factor that replacement of the equipment also lay ahead -- by the same manufacturer -- but what was probably more important yet was the fact that Erasmus University, as well as KHT and RL are institutes with a relatively high number of alpha [courses in liberal arts at Dutch

universities] and gamma [other arts courses at Dutch universities] components in their educational programs. The government takes the position that these require less computer work than beta courses, the predominant component at technical colleges. And less computer work means smaller subsidies... however, the coupling of the three computer centers means recognition as a key center and that is financially much more advantageous.

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TECHNOLOGY TRANSFER

FRANCE SEEKS CLOSER S&T COOPERATION WITH JAPAN

Paris AFP SCIENCES in French 6 Jun 85 p 8

[Text] Tokyo--On 31 May, during French Day at the Tsukuba Show, Hubert Curien, minister of research and technology, expressed a wish for a more profound and extensive scientific and technical cooperation between Paris and Tokyo. This sentiment correctly expresses France's desire to develop its contacts with this country, whose economic and commercial breakthroughs are thought provoking.

"Cooperation between Japan and France already has a history enriched by joint experience. I hope that it will intensify in the future and that it will expand into new fields," declared the minister, who spent a whole day visiting the show.

Reichi Takeuchi, Japanese minister for research and technology, Haruo Ikawa, general manager of the show, and many other notables, manufacturers, and high officials of the French ministries of research and industry, accompanied the minister.

Mr Curien mentioned several instances, "illustrative" of the French-Japanese cooperation, such as the Kaiko sea diving program, the nuclear (fuel cycle) project, robotics, energy saving techniques, medical research, and so on. He believes that "considerable future possibilities exist in such fields as scientific and technical information, and that "favorable prospects" for collaboration are presented by new materials in electronics, and notably in biotechnologies.

In aerospace with Ariane, the minister added, "ESA and our European manufacturers have now strongly demonstrated their effectiveness. I believe it is entirely desirable that a closer cooperation be established between your organizations and our manufacturers."

During his stay, Mr Curien held meetings with the Ministry of Education, Science, and Culture, with Mr Takeuchi, with the director general of the Agency for Sciences and Technology, and so on. Not only did he raise the possibility for new cooperations, but he also discussed with them the direction and outline of the EUREKA project, and explained the progress of European technology.

An interesting event occurred during the minister's visit: the round table he chaired with all the French advisers and scientific attaches of the Pacific zone, on the topic "Japan and its Scientific, Technologic, and Industrial Policy in the Asiatic Region: How French Technology is Perceived With Respect to the Japanese and American Presence." Jean-Loup Motchane, director for scientific and technical cooperation in the Ministry of Foreign Relations, read a message from his minister, Roland Dumas, congratulating him for this event.

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TECHNOLOGY TRANSFER

BRIEFS

AUSTRIA-JAPAN JOINT VENTURE--The Austrian company Voest Alpine has just signed an agreement with Oki, to create a joint venture specialized in the fabrication of dynamic RAM's, microprocessors, and gate arrays. This agreement, rather similar to the one reached between the Austrian company and Gould AMI in 1981, which ended up in the creation of Austrian Microsystems International, provides for the installation in Austria, of a production unit (51 percent Oki, 49 percent Voest Alpine) which should begin to assemble 256K DRAM's in mid-1986. At full capacity, the total production should reach 5 million units per year. [Text] [Paris ELECTRONIQUE ACTUALITES in French 6 Jun 85 p 17] 11,023

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